Helios Mission Support

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This article reports on activities of the DSN Network Operations Organization in support of the Helios Project from 15 October through 15 December 1978.

I. Introduction

This article is the twenty-fifth in a continuing series of reports that discuss Deep Space Network support of Helios Mission Operations. Included in this article is information on the 8th perihelion of Helios 1 and the 6th perihelion of Helios 2, science experiments, 22-bit error polynomial code (EPC) testing and other mission-related activities.

II. Mission Operations and Status

The 8th perihelion of Helios 1 occurred on November 5 at 10:11 Universal Time (UTC). The perihelion phase was covered by DSS 68 in Weilheim, West Germany. The data was obtained at a bit rate of 64 bits per second (bps). All spacecraft subsystems and experiments worked excellently, although several temperature hard limit exceedings were encountered, none of which were considered to be critical. A spacecraft emergency was declared on November 11 at 22:40 UTC, when Station 43 in Australia was unable to acquire the downlink at the scheduled 20:30 UTC. Station 44 (Honeysuckle Creek, Australia) was also unsuccessful in attempting to acquire the downlink. After transmission of the appropriate traveling wave tube (TWT) turnon command, DSS 43 acquired the downlink at 23:27.53 UTC. The subsequent data evaluation showed that a regulator switch had occurred (the eleventh). The memory data showed that the switch occurred at 16:48:25 UTC during a noncoverage period. The spacecraft emergency was lifted on November 12 at 09:30 UTC. There still remains a power fluctuation of approximately 21 watts. The experimenters are evaluating their data for any unusual signs.

The Helios 2 spacecraft remains in good condition. All subsystems and experiments worked well during the 6th perihelion on November 2 at 02:00 UTC. Helios 2 also experienced hard limit temperature exceedings, none of which were considered to be critical.

III. Special Activities

A. Support of Onboard and Ground Experiments

During the perihelion and superior conjunction periods, of both Helios 1 and 2, prime data types collected were Faraday rotation, ellipticity (Experiment 12) and solar wind.

B. German Space Operations Center (GSOC) Conversion to the 22-Bit Error Polynominal Code (EPC) and Mark III Data Command System

As reported in the last article (Ref. 1), testing continued until November 3 at 16:00 UTC, at which time the 22-bit EPC system was accepted for operational use.

C. Station 12 34-Meter Conversion

DSS 12 successfully completed its first (post 34-meter conversion) Helios demonstration pass on November 11 and was placed under configuration control for operational support on December 2 00:00 UTC.

Reference

1. Goodwin, P. S., Jensen, W. N., and Rockwell, G. M., "Helios Mission Support," in *The Deep Space Network Progress Report 42-47,* pp. 26-28, Jet Propulsion Laboratory, Pasadena, Calif., Dec. 1978.